

**Pomona Lake
2000 Water Quality Report**

1. General.

a. **Project location.** Pomona Dam is located approximately 6 miles northwest of Pomona, Kansas, at river mile 8.3 on the One Hundred and Ten Mile Creek, a tributary of the Marais des Cygnes River. The project watershed encompasses 322 square miles in east-central Kansas.

b. **Authorized project purposes.** The primary project purposes are flood control, low flow supplementation, and water quality; equally important, however, are its fish and wildlife resources, recreation, and water supply benefits.

c. **Pertinent data.**

Pools	Surface Elevation (ft. above m.s.l.)	Current Capacity (1,000 A.F.)	Surface Area (acres)	Shoreline (miles)
Flood Control	1,003	176.1	8,522	
Multipurpose	974	64.2*	3,871	52
Inactive		20.9**		
Total		240.3		

Total Drainage Area: 322 sq. miles

Average Annual Inflow: 143,721 acre-feet

* Based on most recent hydrographic survey

** Contained in multipurpose pool

2. Activities and studies of the year.

Monthly herbicide and nutrient sampling was conducted by lake project personnel, with technical and analytical support from PM-PR-W, April-September 2000 at one inflow station, three lake stations (two depths), and the outlet. Nutrient samples were shipped to the Chemical and Materials Quality Assurance Laboratory (CMQAL) in Omaha for analysis while the herbicide samples were shipped to the PM-PR-W laboratory for analysis of four of the most commonly occurring herbicides by the enzyme linked immunosorbent assay (ELISA) method. Ten percent of the herbicide samples were shipped to the CMQAL to be analyzed by Gas Chromatography (GC) for quality control purposes. All generated data were entered in Excel spreadsheets as an interim to the EPA national water quality data management system, NEW

STORET, which is to become readily available to us later this year. Table 1 at the end of this report includes all the available nutrient and herbicide data for the years 1996-2000.

The OF-PO is to be commended for its continued support of water quality monitoring of Pomona Lake and its tributaries. The OF-PO personnel deserving special recognition include Messrs. David White and former Project manager Lew Ruona.

3. Existing conditions.

a. Inflow.

Dragon Creek south of Burlingame, Kansas, was sampled monthly from April-September 2000. The average total nitrogen (i.e., $\text{NH}_3 + \text{NO}_2 + \text{NO}_3 + \text{TKN}$) concentration was close to eutrophic levels (> 1 mg/L) at 0.71 mg/L (maximum of 1.05 mg/L), which continues to demonstrate the elevated, long-term nutrient load to the stream. Figure 1 shows the trend for total nitrogen concentrations over four of the past five years.

FIGURE 1: PO-11

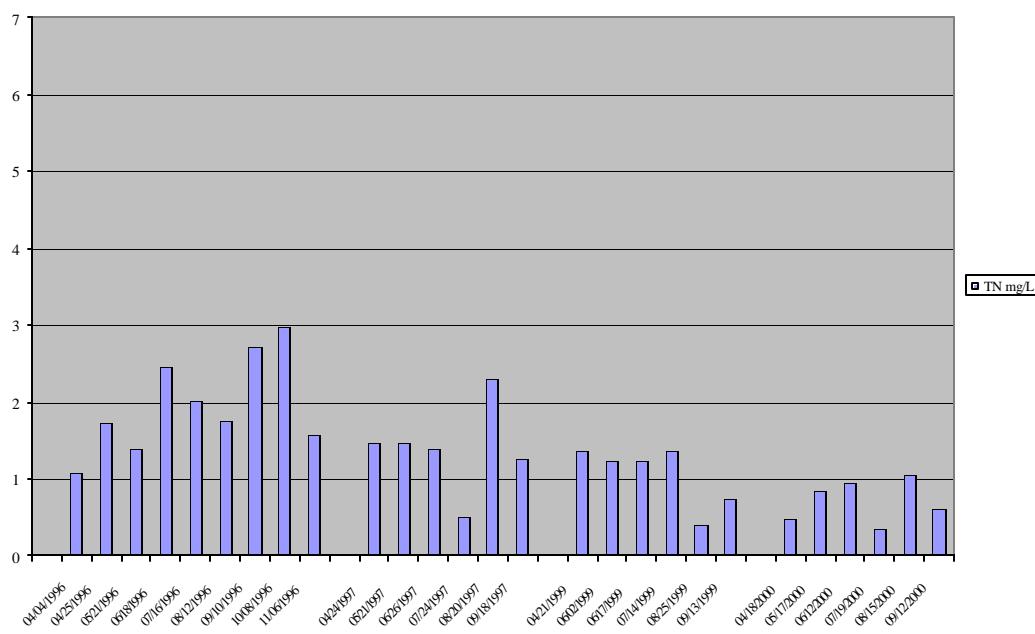
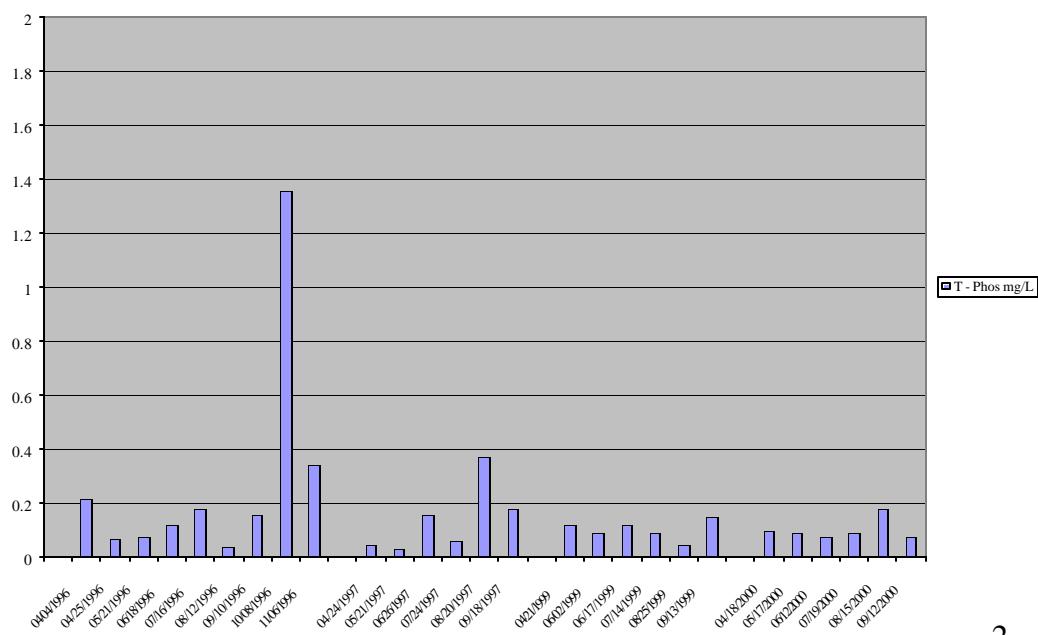


FIGURE 2: PO-11



As can be seen from this graph, levels have typically been above eutrophic levels with spikes occurring during high inflows such as June 1996. The total phosphorus (TP) mean concentration, 0.10 mg/L, remains at the Environmental Protection Agency (EPA) suggested stream criterion of 0.1 mg/L for the protection of aquatic ecosystems. The stream has been characterized by moderately eutrophic phosphorus levels over the period of record (figure 2).

Within the six-month sampling period of April-September for herbicides, atrazine and metolachlor were the most prevalent. The mean and maximum for atrazine were 1.83 ug/L and 3.17 ug/L, respectively. The June runoff was above the EPA maximum contaminant level (MCL) standard for drinking water supplies of 3 ug/L. The trend for four of the past five years is shown in figure 3. The mean and maximum for metolachlor were 0.48 ug/L and 0.90 ug/L, respectively. Cyanazine and alachlor were

FIGURE 3: PO-11

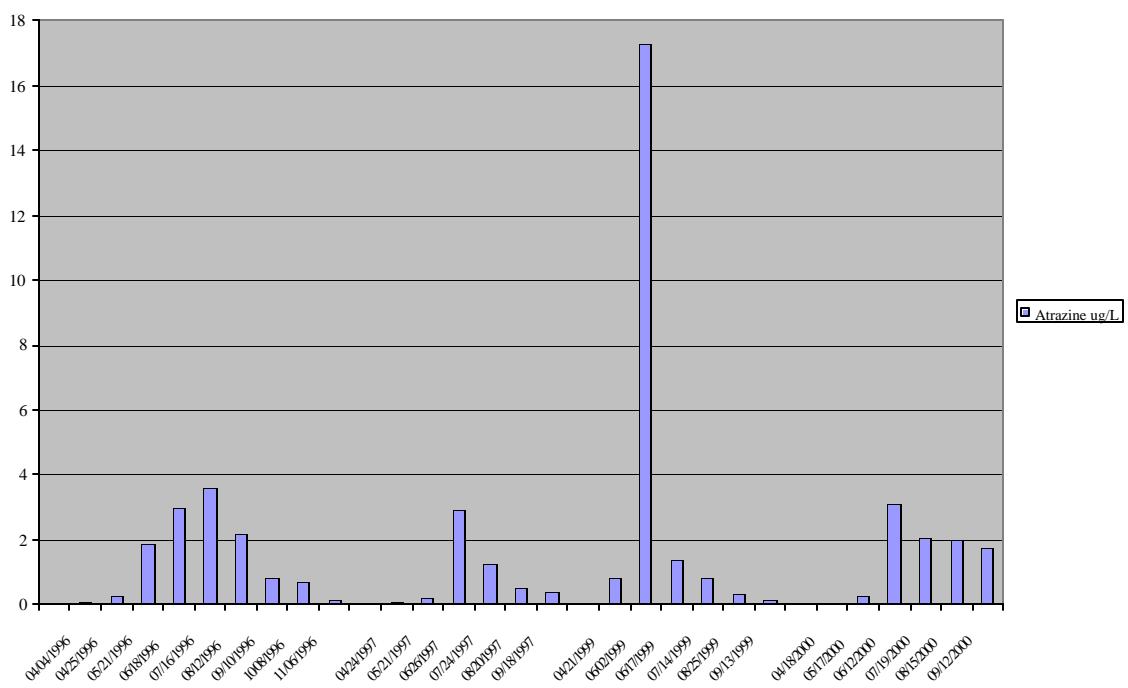
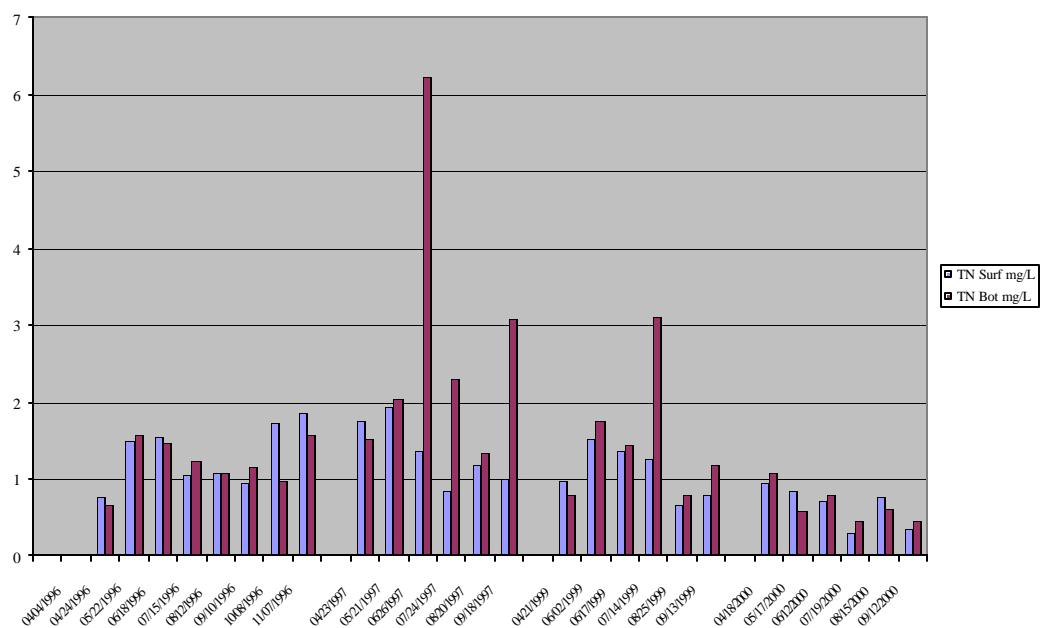


FIGURE 4: PO-3



detected in smaller quantities and were well below the suggested EPA standard for drinking water of 1 ug/L and 2 ug/L, respectively. To date the EPA has not set standards for metolachlor.

b. Lake.

The three stations sampled during the six-month sampling period were downlake near the dam (station PO-3), midlake (station PO-7), and the Ten Mile Creek arm (station PO-12). As can be seen in figures 4, 5,

and 6, nutrient concentrations were typical of the impoundment over the period of record. These three graphs show the relationship between surface and bottom concentrations for four of the past five years. Concentrations within the water column appear to be very uniform this year. The high spikes during past years can be attributed to high inflows and temperature differences between surface

and bottom waters. The 2000 mean and maximum total nitrogen concentrations in the surface waters were 0.66 mg/L and 0.95 mg/L, respectively, at PO-3; 0.72 mg/L and 1.08 mg/L, respectively, at PO-7; and

FIGURE 5: PO-7

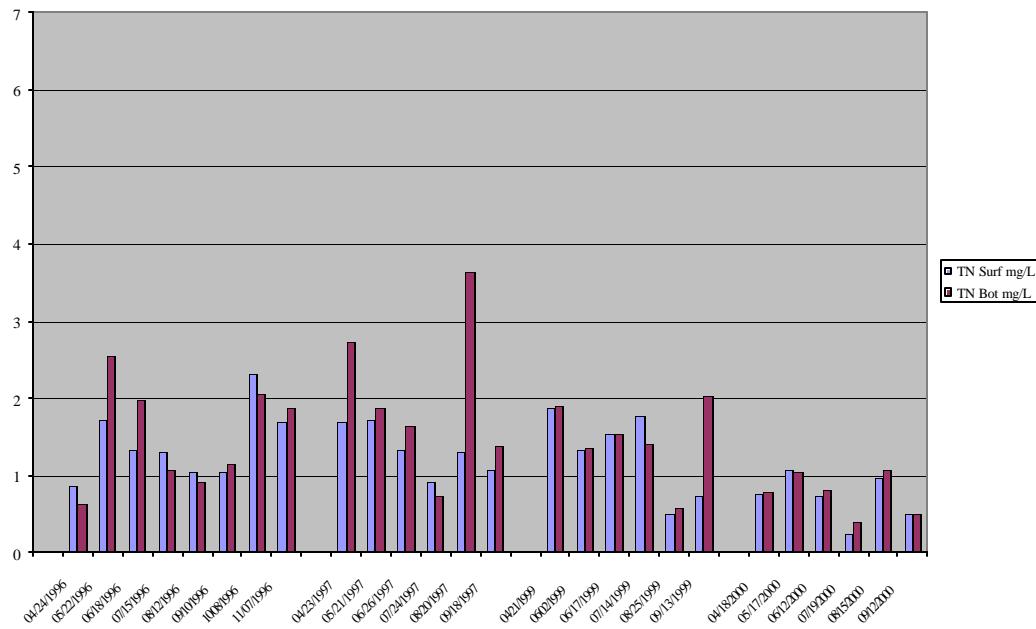
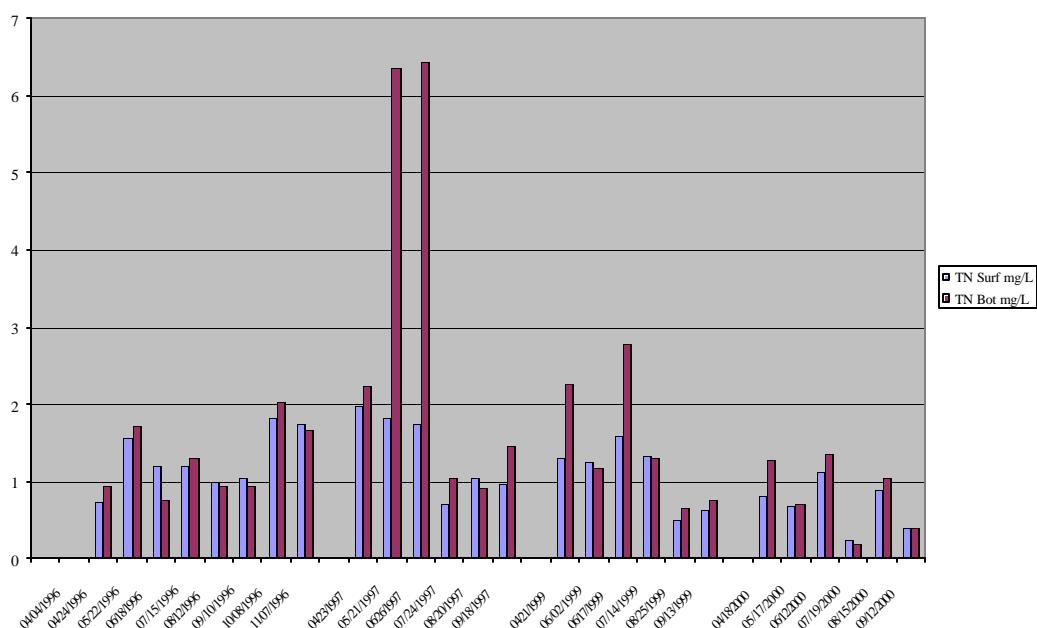


FIGURE 6: PO-12



0.69 mg/L and 1.12 mg/L, respectively, at PO-12. Mean and maximum total nitrogen concentrations in the bottom waters were similar; PO-3, 0.66 mg/L and 1.09 mg/L, respectively; PO-7, 0.77 mg/L and 1.07 mg/L,

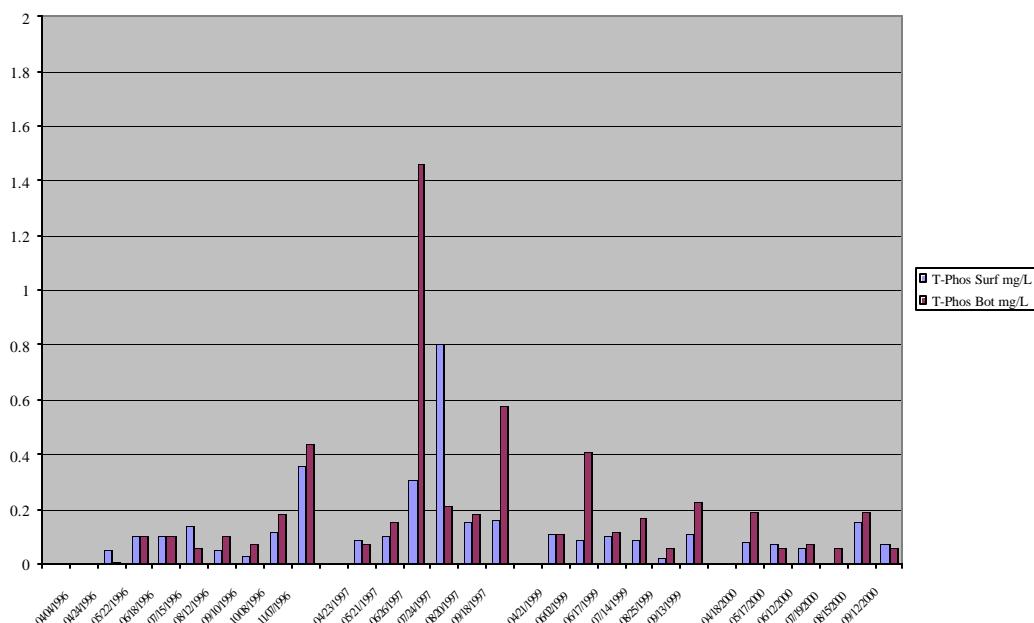
respectively; and PO-12, 0.83 mg/L and 1.35 mg/L, respectively.

Total phosphorus concentrations contributed to the eutrophic nature of the lake with mean and maximum concentrations in the surface waters of 0.09

mg/L and 0.15 mg/L, respectively, at PO-3; 0.13 mg/L and 0.40 mg/L, respectively, at PO-7; and 0.09 mg/L and 0.13 mg/L, respectively, at PO-12. Mean total phosphorus concentrations in the bottom waters were about double the concentration in the surface waters. The ratios of total nitrogen to total phosphorus in each section of the reservoir indicate phosphorus is the limiting nutrient.

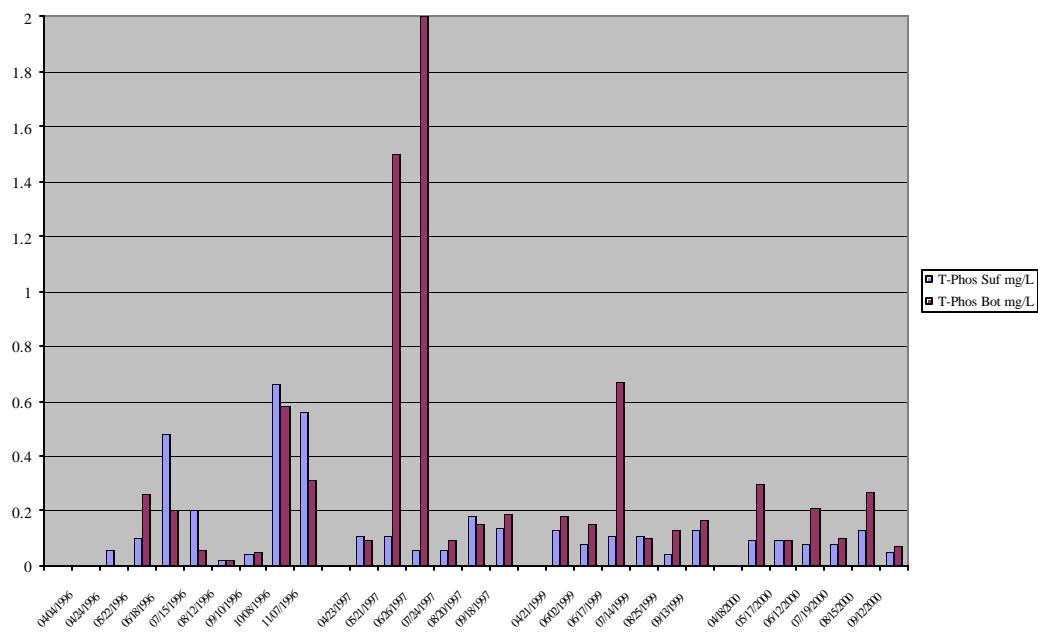
Figures 7, 8, and 9 show concentrations at the surface and bottom depths throughout the lake from 1996-2000. Again, the high spikes can be attributed to high inflows and temperature differences

FIGURE 7: PO-3



between surface and bottom waters. These nutrient levels continue to be within moderately eutrophic ranges. It is suspected the lower concentrations this year are due to the near drought conditions during the sampling season.

FIGURE 9: PO-12

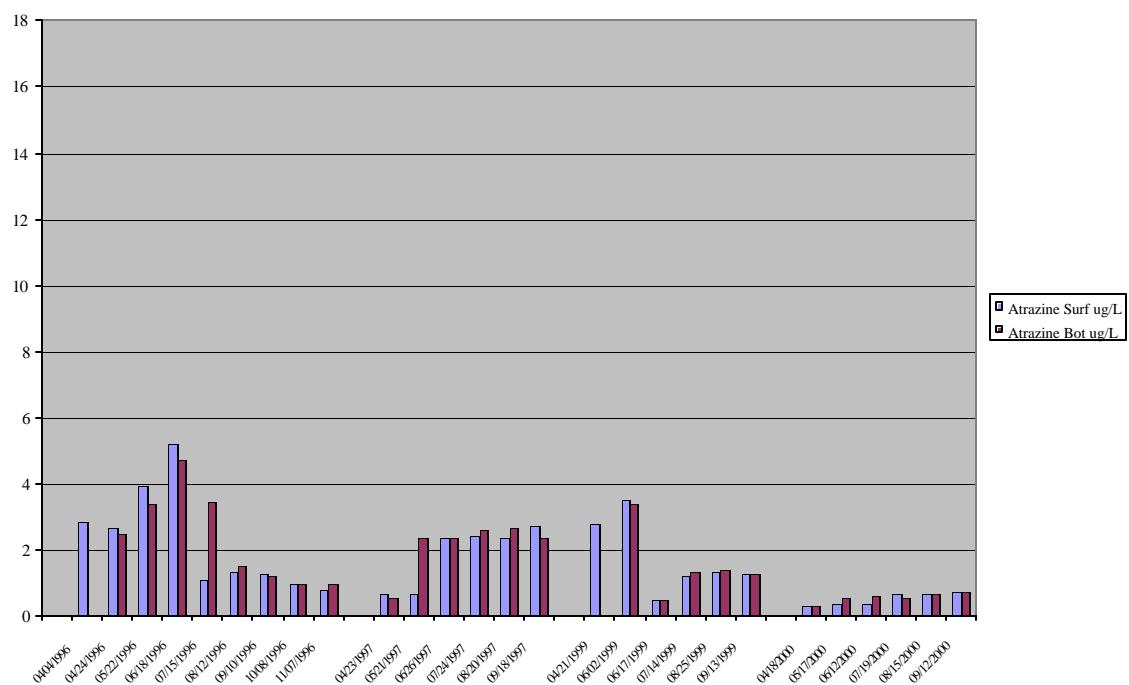


In the monthly surveys during April-September, the four herbicides (atrazine, metolachlor, alachlor, and cyanazine) were detected. A test for acetochlor was also conducted in July but the herbicide was not detected. Concentrations of atrazine were much lower throughout the lake due to drought like

conditions during the sampling season.

Atrazine was detected in 100% of the 2000 samples. None of the samples exceeded the MCL of 3 ug/L for atrazine. The mean and maximum atrazine concentrations

FIGURE 10: PO-3



in the surface waters of the lake were as follows, 0.53 ug/L and 0.77 ug/L (PO-3); 0.61 ug/L and 0.78 ug/L (PO-7); and 0.60 ug/L and 0.73 ug/L (PO-12), respectively. Bottom mean and maximum atrazine concentrations for the above areas were 0.60 ug/L and 0.74 ug/L; 0.67 ug/L and 0.96 ug/L;

and 0.61 ug/L and 0.76 ug/L, respectively.

Figures 10,

11, and 12

show the trend for atrazine for the years 1996-2000. As can be seen from these graphs, high

concentrations normally occur throughout the lake in early spring during the high run-off periods and then level off. For the

most part concentrations are uniform throughout the water column. Metolachlor was detected in 97% of the 2000 samples. The mean and maximum metolachlor

concentrations in the surface waters were as follows, 0.26 ug/L and 0.51

FIGURE 11: PO-7

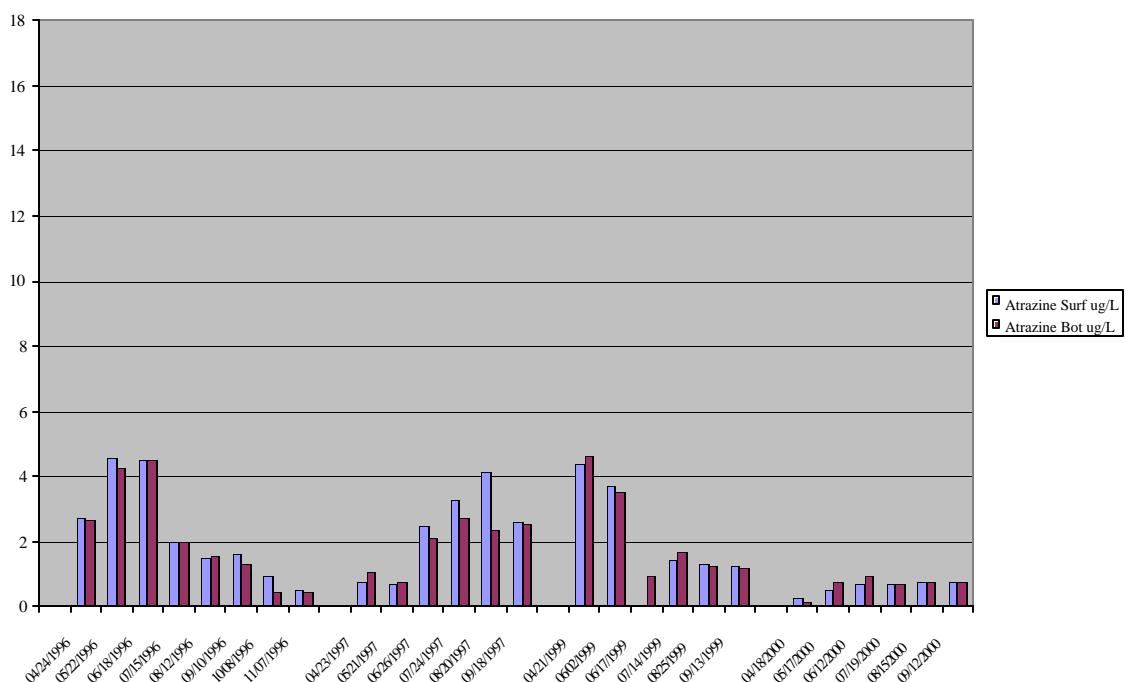
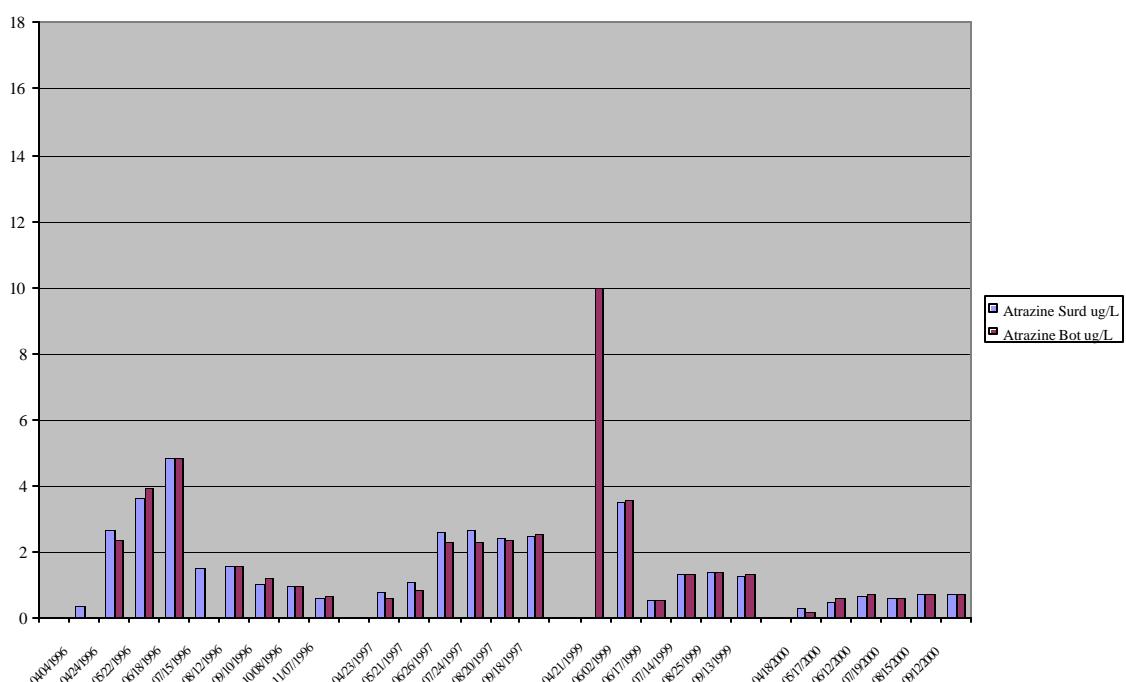


FIGURE 12: PO-12



ug/L (PO-3); 0.24 ug/L and 0.51 ug/L (PO-7); and 0.25 ug/L and 0.43 ug/L (PO-12), respectively. Bottom mean and maximum concentrations for the above areas were 0.17 ug/L and 0.27 ug/L; 0.24 ug/L and 0.51 ug/L; and 0.21 ug/L and 0.41 ug/L, respectively. Although detected in 92% and 72%, respectively, of the 2000 samples, neither alachlor nor cyanazine exceeded established criteria.

c. **Outflow.** The present sampling indicated the water quality conditions in the outlet (PO-2) continue to be

satisfactory. The nutrient levels remained moderate with mean total nitrogen and total phosphorus concentrations of 0.86 mg/L and 0.14 mg/L, respectively. Again, as shown in figures 13, and 14, concentrations are higher during the high run-off periods. Total nitrogen and total phosphorus concentrations remained fairly consistent within the four years represented by the graphs. The mean and

FIGURE 13: PO-2

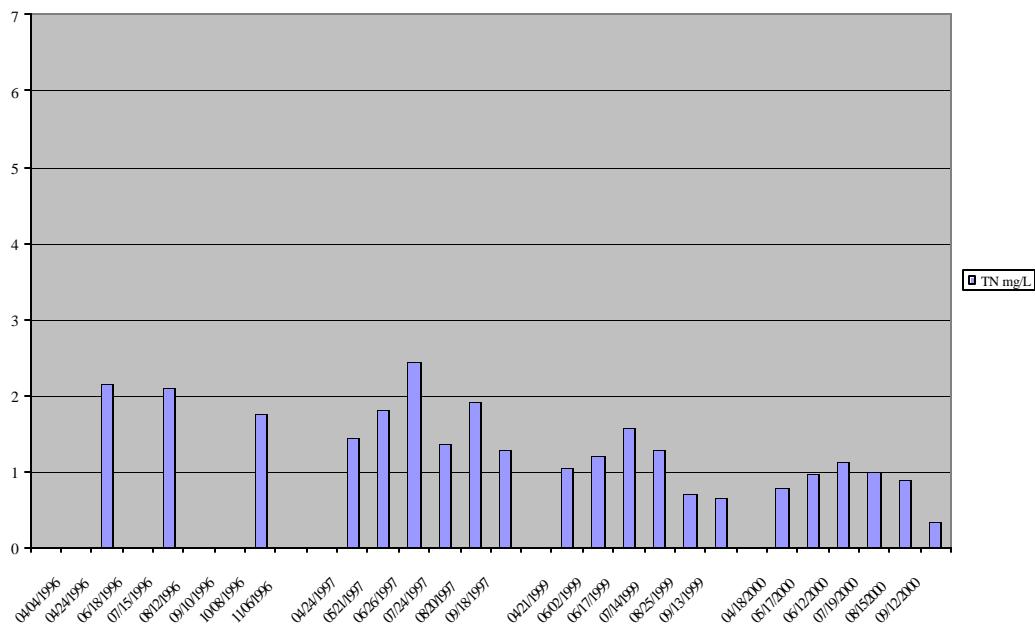
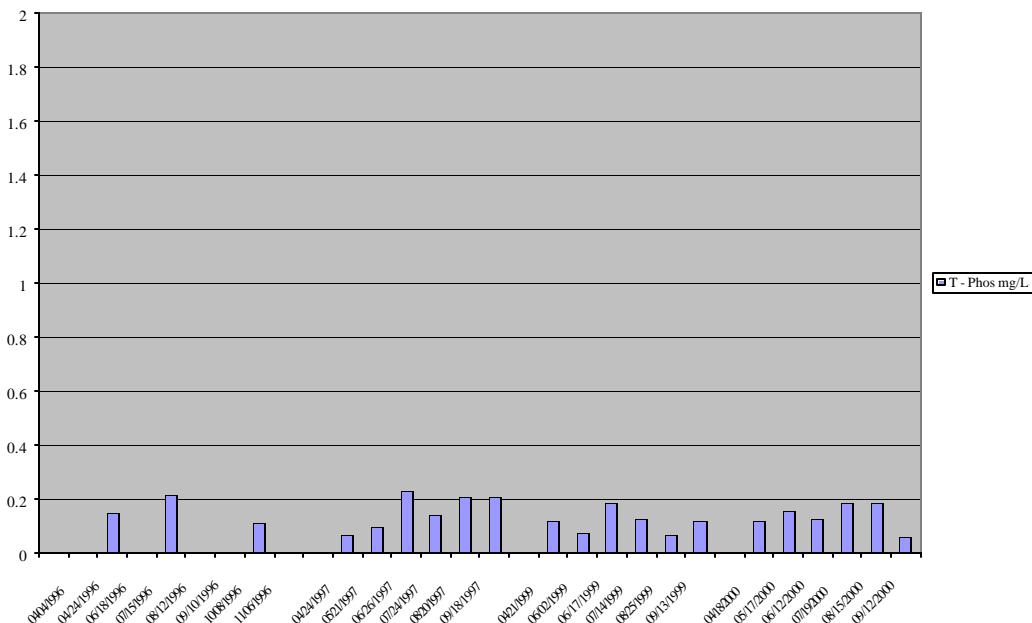


FIGURE 14: PO-2

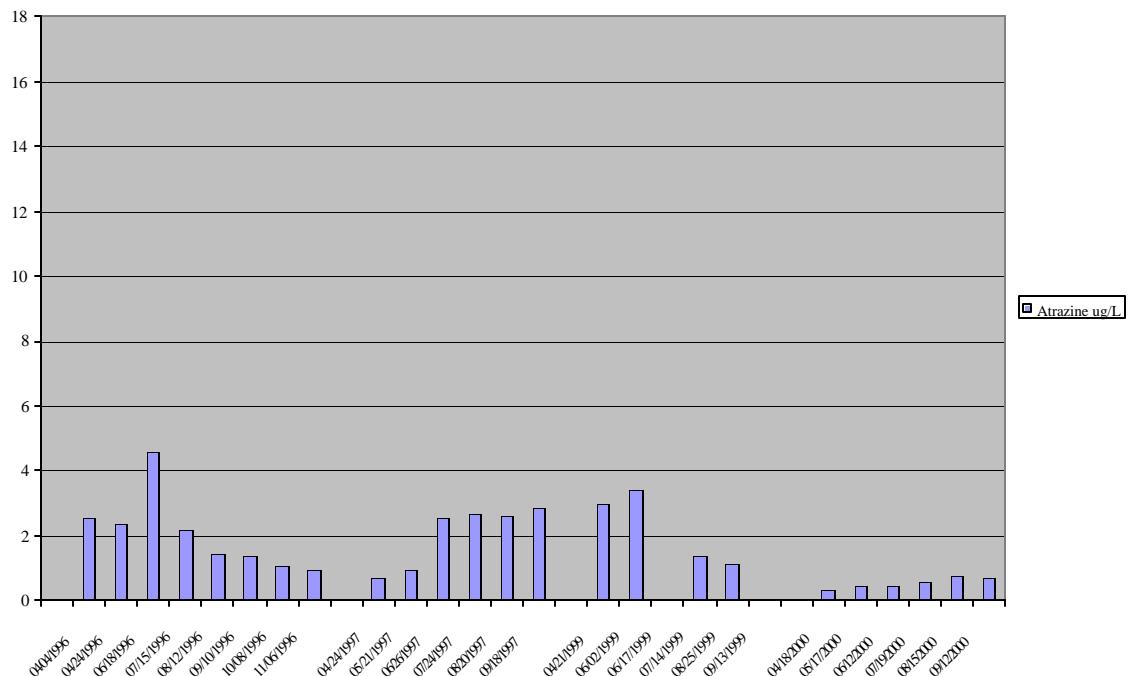


maximum concentrations for atrazine were 0.53 ug/L and 0.74 ug/L, respectively, for the 2000 survey periods. None of the samples exceeded the MCL of 3 ug/L for atrazine. Figure 15 shows the trend for the years 1996-2000. As can be seen from this graph, 1999 concentrations remained

fairly consistent with the first two years shown and 2000 was much lower, consistent with the lower inflows. The mean and maximum concentrations for metolachlor were 0.25 ug/L and 0.47 ug/L, respectively.

Although detected in the 2000 samples, neither alachlor nor cyanazine exceeded established criteria.

FIGURE 15: PO-2



4. Future conditions .

The water quality of Pomona Lake is moderately good overall as evidenced by its excellent sport fishery of crappie, walleye, channel catfish, and white bass. The parameters most responsible for the lake's water quality will continue to be turbidity, suspended solids, and nutrients; however, with the increased detection of herbicides in the reservoir, seemingly the greatest potential threat is pesticide loading derived from agricultural run-off from row crops within the watershed. Atrazine concentrations for the period of record (1988-2000) show a continued exceedance of the EPA criterion of 1 ug/L for the protection of aquatic life. The concentrations in many periods exceed the EPA MCL of 3 ug/L, the maximum permissible level of a contaminant in public drinking water. Past monitoring has shown that the pesticide levels pose a continuing threat to the drinking water supplies for the project and recreation areas and to the rural water districts, since present water treatment is inadequate to significantly reduce these pollutants in the finished water unless activated carbon filtration is provided.

5. Recommendations .

With the current staffing and funding levels, the water quality surveillance program for

Pomona Lake will continue to be limited in 2001. Routine monthly pesticide and nutrient sampling should be conducted by Project personnel with logistic and analytical support from PM-PR-W. The extension of the Lower Osage River Basin Model to include the Upper Osage River Basin should be attempted in-house or contracted out in 2002. The District should enlist the other state and Federal agencies in developing a cooperative water quality monitoring and abatement program for Pomona Lake and its watershed in 2002 similar to the one currently underway for Hillsdale Lake and the Big Bull watershed.

TABLE 1: POMONA LAKE DATA 1996-2000

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO - 11	0.1	04/04/1996	1511	0.11	<0.05	0.07	<0.04		<0.02	0.79	0.30	1.09	0.22	0.19
	0.1	04/25/1996	1115	0.30	<0.05	0.07	0.06		0.24	0.68	0.80	1.72	0.07	0.01
	0.1	05/21/1996	1350	1.89	0.21	1.26	0.15		0.04	0.75	0.60	1.39	0.08	<0.01
	0.1	06/18/1996	1355	2.99	0.20	0.91	0.16		0.04	2.02	0.40	2.46	0.12	<0.01
	0.1	07/16/1996	1120	3.60	<0.05	2.00	<0.04		0.03	1.38	0.60	2.01	0.18	0.03
	0.1	08/12/1996	1435	2.20	<0.05	0.80	<0.04		0.15	0.91	0.70	1.76	0.04	0.01
	0.1	09/10/1996	1210	0.80	<0.05	0.40	<0.04		0.03	1.59	1.10	2.72	0.16	<0.01
	0.1	10/08/1996	1220	0.72	<0.05	0.33	<0.04		<0.02	0.67	2.30	2.97	1.36	0.06
	0.1	11/06/1996	1315	0.12	<0.05	0.05	<0.04		0.43	0.14	1.00	1.57	0.34	0.05
	Average			1.41	0.21	0.65	0.12		0.14	0.99	0.87	1.97	0.29	0.06
PO - 11	0.1	04/24/1997	1115	0.06	<0.05	0.06	<0.04		<0.02	0.57	0.90	1.47	0.05	0.02
	0.1	05/21/1997	1104	0.19	0.15	0.07	<0.04		0.03	0.54	0.90	1.47	0.03	0.01
	0.1	06/26/1997	1410	2.90	1.36	1.58	0.14		<0.02	0.08	1.30	1.38	0.16	0.06
	0.1	07/24/1997	1100	1.24	0.64	0.42	0.13		<0.02	0.01	0.50	0.51	0.06	0.03
	0.1	08/20/1997	0845	0.51	0.14	0.89	0.06		0.06	0.55	1.70	2.31	0.37	0.19
	0.1	09/18/1997	1100	0.37	0.07	0.31	0.04		<0.02	0.06	1.20	1.26	0.18	0.05
Average				0.88	0.47	0.56	0.09		0.05	0.30	1.08	1.40	0.14	0.06
	PO - 11	0.1	04/21/1999	1122	0.82	0.07	0.27	0.05	U	1.06	0.29	1.35	0.12	0.06
PO - 11	0.1	06/02/1999	1030	17.30	0.37	4.56	0.27		0.07	0.80	0.36	1.23	0.09	0.05
	0.1	06/17/1999	1115	1.36	0.10	0.32	0.13		0.13	0.37	0.74	1.24	0.12	0.04
	0.1	07/14/1999	1100	0.83	0.20	0.30	0.10		0.04	0.83	0.50	1.37	0.09	0.01
	0.1	08/25/1999	0940	0.33	0.08	0.11	<0.04		0.17	U	0.23	0.40	0.05	0.03
	0.1	09/13/1999	0955	0.17	<0.05	0.07	<0.04		0.11	0.02	0.60	0.73	0.15	0.05
	Average			3.47	0.16	0.94	0.14		0.10	0.62	0.45	1.05	0.10	0.04
PO-11	0.1	04/18/2000	0915	<0.05	0.11	0.10	<0.04		U	U	0.48	0.48	0.10	0.02
	0.1	05/17/2000	0930	0.26	<0.05	0.15	0.11		U	U	0.84	0.84	0.09	0.01
	0.1	06/12/2000	1045	3.12	0.36	0.88	<0.04		0.26	0.09	0.61	0.96	0.08	U
	0.1	07/19/2000	1030	2.06	0.51	0.90	0.15	<0.04	0.04	U	0.30	0.34	0.09	0.02
	0.1	08/15/2000	1005	1.97	0.42	0.45	0.11		0.06	U	0.98	1.04	0.18	0.03
	0.1	09/12/2000	0900	1.74	0.36	0.38	0.13		U	U	0.60	0.60	0.08	0.03
Average				1.83	0.35	0.48	0.13		0.12	0.09	0.64	0.71	0.10	0.02
	PO - 2	0.1	04/04/1996	1132	2.57	0.13	0.52	0.16						
PO - 2	0.1	04/24/1996	1200	2.35	0.12	0.43	0.15		0.56	0.69	0.90	2.15	0.15	0.02
	0.1	06/18/1996	1448	4.59	0.97	2.22	0.25							
	0.1	07/15/1996	1306	2.19	0.72	<0.05	0.05		0.05	1.54	0.50	2.09	0.22	0.23
	0.1	08/12/1996	1554	1.45	0.52	1.49	0.07							
	0.1	09/10/1996	1125	1.36	0.48	1.48	0.06		0.03	0.42	1.30	1.75	0.11	0.05
	0.1	10/08/1996	1110	1.09	0.57	1.07	0.05							
	0.1	11/06/1996	1231	0.93	0.22	0.95	<0.04							
	Average			2.07	0.47	1.17	0.11		0.21	0.88	0.90	2.00	0.16	0.10

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO - 2	0.1	04/24/1997	1150	0.71	<0.05	0.57	0.06		<0.02	0.74	0.70	1.44	0.07	0.02
	0.1	05/21/1997	1136	0.95	0.52	0.55	0.07		0.11	0.59	1.10	1.80	0.10	0.06
	0.1	06/26/1997	1450	2.57	0.53	1.77	0.13		0.06	1.28	1.10	2.44	0.23	0.06
	0.1	07/24/1997	1132	2.64	1.09	1.33	0.23		0.37	0.10	0.90	1.37	0.14	0.08
	0.1	08/20/1997	0930	2.60	0.71	1.09	0.50		0.39	0.04	1.50	1.93	0.21	0.07
	0.1	09/18/1997	1020	2.84	0.42	0.55	0.15		<0.02	0.29	1.00	1.29	0.21	0.14
Average				2.05	0.65	0.98	0.19		0.23	0.51	1.05	1.71	0.16	0.07
PO - 2	0.1	04/21/1999	1030	3.01	0.77	1.25	0.13		U	0.61	0.45	1.06	0.12	0.05
	0.1	06/02/1999	0945	3.41	0.69	1.29	0.16		U	0.98	0.24	1.22	0.08	0.07
	0.1	06/17/1999	1035						0.09	0.72	0.77	1.58	0.19	0.12
	0.1	07/14/1999	1015	1.41	1.11	1.26	0.11		0.14	0.74	0.41	1.29	0.13	0.04
	0.1	08/25/1999	0905	1.13	0.66	1.00	0.07		0.17	0.28	0.26	0.71	0.07	0.06
	0.1	09/13/1999	0920						U	0.26	0.39	0.65	0.12	0.04
Average				2.24	0.81	1.20	0.12		0.13	0.60	0.42	1.09	0.12	0.06
PO-2	0.1	04/18/2000	0840	0.32	0.25	0.47	<0.04		0.02	0.28	0.50	0.80	0.12	0.03
	0.1	05/17/2000	0852	0.46	<0.05	0.28	0.13		U	0.09	0.89	0.98	0.16	0.04
	0.1	06/12/2000	1010	0.44	0.14	0.13	<0.04		0.23	0.17	0.72	1.12	0.13	0.02
	0.1	07/19/2000	1200	0.56	0.20	0.30	0.06	<0.04	0.25	0.06	0.70	1.01	0.19	0.08
	0.1	08/15/2000	0915	0.74	0.23	0.18	0.06		0.04	0.11	0.75	0.90	0.19	0.04
	0.1	09/12/2000	0940	0.68	0.19	0.16	0.07		U	0.05	0.30	0.35	0.06	0.04
Average				0.53	0.20	0.25	0.08		0.14	0.13	0.64	0.86	0.14	0.04
PO - 3	0.1	04/04/1996	1200	2.84	0.17	0.68	0.21							
	0.1	04/24/1996	1015	2.70	0.21	0.53	0.19		0.21	0.05	0.50	0.76	0.05	0.01
	0.1	05/22/1996	1000	3.93	0.51	1.83	0.18		0.57	0.33	0.60	1.50	0.10	0.05
	0.1	06/18/1996	1145	5.19	1.06	1.79	0.14		0.03	0.81	0.70	1.54	0.10	0.09
	0.1	07/15/1996	1100	1.10	0.65	0.50	<0.04		0.02	0.73	0.30	1.05	0.14	0.04
	0.1	08/12/1996	1115	1.38	0.58	1.87	0.15		<0.02	0.58	0.50	1.08	0.05	0.04
	0.1	09/10/1996	0845	1.28	0.45	1.45	0.08		0.22	0.13	0.60	0.95	0.03	<0.01
	0.1	10/08/1996	1330	1.01	0.41	1.05	<0.04		<0.02	0.62	1.10	1.72	0.12	0.02
	0.1	11/07/1996	1000	0.81	0.23	0.95	<0.04		0.57	0.39	0.90	1.86	0.36	0.06
Average				2.25	0.47	1.18	0.16		0.27	0.46	0.65	1.31	0.12	0.04
PO - 3	0.1	04/23/1997	1030	0.67	0.32	0.67	0.06		<0.02	0.76	1.00	1.76	0.09	0.05
	0.1	05/21/1997	0840	0.70	0.47	0.54	0.10		0.10	0.74	1.10	1.94	0.10	0.05
	0.1	06/26/1997	1220	2.35	0.59	1.67	0.20		<0.02	0.56	0.80	1.36	0.31	0.22
	0.1	07/24/1997	0830	2.47	1.11	1.30	0.22		<0.02	0.03	0.80	0.83	0.80	0.04
	0.1	08/20/1997	0820	2.36	0.50	0.85	0.13		<0.02	0.08	1.10	1.18	0.15	0.04
	0.1	09/18/1997	0851	2.76	0.46	0.53	0.15		<0.02	0.20	0.80	1.00	0.16	0.07
Average				1.89	0.58	0.93	0.14		0.10	0.40	0.93	1.35	0.27	0.08

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO - 3	0.1	04/21/1999	0740	2.77	0.70	1.10	0.14		U	0.42	0.56	0.98	0.11	0.05
	0.1	06/02/1999	0710	3.54	0.97	1.39	0.17		0.04	0.98	0.49	1.51	0.09	0.05
	0.1	06/17/1999	0810	0.53	0.76	1.37	0.07		0.07	0.92	0.38	1.37	0.10	0.08
	0.1	07/14/1999	0850	1.21	1.07	1.35	0.08		0.05	0.89	0.33	1.27	0.09	0.04
	0.1	08/25/1999	0740	1.35	0.71	0.91	0.10		0.10	0.29	0.26	0.65	0.02	0.02
	0.1	09/13/1999	0750	1.30	0.60	1.02	0.08		U	0.25	0.55	0.80	0.11	0.03
Average				1.78	0.80	1.19	0.11		0.07	0.63	0.43	1.10	0.09	0.05
PO-3	0.1	04/18/2000	0700	0.30	0.33	0.31	<0.04		U	0.28	0.67	0.95	0.08	0.02
	0.1	05/17/2000	0702	0.38	0.32	0.51	0.14		U	0.11	0.74	0.85	0.07	0.02
	0.1	06/12/2000	0837	0.41	0.18	0.18	<0.04		0.19	U	0.53	0.72	0.06	U
	0.1	07/19/2000	0817	0.67	0.21	0.24	0.08	<0.04	0.03	U	0.27	0.30	U	U
	0.1	08/15/2000	0706	0.67	0.18	0.14	0.06		0.04	U	0.72	0.76	0.15	0.01
	0.1	09/12/2000	0707	0.77	0.20	0.15	0.08		U	0.06	0.30	0.36	0.07	0.03
Average				0.53	0.24	0.26	0.09		0.09	0.15	0.54	0.66	0.09	0.02
PO - 3	11.0	04/24/1996	1026	2.50	0.17	0.62	0.21		<0.02	0.07	0.60	0.67	0.01	
	13.0	05/22/1996	1013	3.39	0.43	1.62	0.19		0.61	0.36	0.60	1.57	0.10	0.05
	13.0	06/18/1996	1158	4.74	1.10	1.91	0.15		0.19	0.79	0.50	1.48	0.10	0.16
	12.0	07/15/1996	1112	3.46	0.73	<0.05	0.11		0.06	0.58	0.60	1.24	0.06	
	12.0	08/12/1996	1127	1.52	0.68	1.80	0.13		<0.02	0.59	0.50	1.09	0.10	0.04
	12.5	09/10/1996	0858	1.24	0.61	1.32	0.08		0.19	0.16	0.80	1.15	0.07	<0.01
	12.0	10/08/1996	1342	0.98	0.43	1.23	<0.04		0.33	0.34	0.30	0.97	0.18	
	13.5	11/07/1996	1014	1.00	0.27	0.86	0.53		0.38	0.40	0.80	1.58	0.44	0.06
Average				2.35	0.55	1.34	0.20		0.29	0.41	0.59	1.22	0.13	0.08
PO - 3	11.5	04/23/1997	1042	0.55	0.21	0.57	0.05		<0.02	0.72	0.80	1.52	0.07	0.06
	12.0	05/21/1997	0852	2.40	<0.1	0.70	<0.1		0.09	0.74	1.20	2.03	0.15	0.05
	12.0	06/26/1997	1232	2.36	0.65	1.77	0.14		0.12	0.61	5.50	6.23	1.46	0.08
	12.0	07/24/1997	0842	2.60	0.72	1.26	0.17		0.37	0.02	1.90	2.29	0.21	0.08
	12.0	08/20/1997	0832	2.65	0.79	0.82	0.17		0.11	0.13	1.10	1.34	0.18	0.06
	12.0	09/18/1997	0903	2.36	0.35	0.48	0.14		0.13	0.35	2.60	3.08	0.58	0.19
Average				2.15	0.54	0.93	0.13		0.16	0.43	2.18	2.75	0.44	0.09
PO-3	13.5	04/21/1999	0754						U	0.42	0.38	0.80	0.11	0.04
	15.0	06/02/1999	0725	3.41	0.90	1.44	0.17		0.08	0.98	0.68	1.74	0.41	0.07
	15.0	06/17/1999	0825	0.48	0.77	1.37	0.06		0.02	0.93	0.49	1.44	0.12	0.07
	13.5	07/14/1999	0904	1.37	1.07	1.33	0.11		0.22	0.70	2.18	3.10	0.17	0.05
	11.0	08/25/1999	0751	1.39	0.53	0.99	0.07		0.20	0.30	0.30	0.80	0.06	0.03
	15.0	09/13/1999	0805	1.29	0.53	0.97	0.06		0.36	0.24	0.58	1.18	0.23	0.04
Average				1.59	0.76	1.22	0.09		0.18	0.60	0.77	1.51	0.18	0.05
PO-3	13.5	04/18/2000	0714	0.33	0.12	0.10	<0.04		0.03	0.27	0.79	1.09	0.19	0.05
	13.5	05/17/2000	0716	0.59	<0.05	0.18	0.11		U	0.10	0.48	0.58	0.06	0.02
	13.5	06/12/2000	0851	0.63	0.14	0.16	0.06		0.18	U	0.60	0.78	0.07	U
	13.5	07/19/2000	0831	0.58	0.22	0.27	0.07	<0.04	0.11	U	0.35	0.46	0.06	0.04
	13.5	08/15/2000	0720	0.71	0.19	0.17	0.06		U	0.06	0.56	0.62	0.19	0.03
	13.5	09/12/2000	0721	0.74	0.20	0.15	0.08		U	0.05	0.40	0.45	0.06	0.04
Average				0.60	0.17	0.17	0.08		0.11	0.12	0.53	0.66	0.11	0.04

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L	
PO - 7	0.1	04/24/1996	1330						0.14	0.03	0.70	0.87	0.10	0.01	
	0.1	04/24/1996	1336	2.71	0.21	0.61	0.18					0.00			
	0.1	05/22/1996	1200	4.54	0.88	2.20	0.24		0.38	0.73	0.60	1.71	0.14	0.06	
	0.1	06/18/1996	1400	4.48	0.46	2.03	0.19		0.11	0.71	0.50	1.32	0.21	0.14	
	0.1	07/15/1996	1330	2.00	0.50	0.31	0.05		<0.02	0.61	0.70	1.31	0.20	0.06	
	0.1	08/12/1996	1315	1.46	0.58	1.28	0.07		0.02	0.13	0.90	1.05	0.08	0.01	
	0.1	09/10/1996	1115	1.60	0.30	1.70	<0.04		0.03	0.01	1.00	1.04	0.11	<0.01	
	0.1	10/08/1996	1030	0.95	0.29	0.71	<0.04		<0.02	0.92	1.40	2.32	0.09	0.02	
	0.1	11/07/1996	1145	0.53	0.19	0.70	<0.04		0.34	0.36	1.00	1.70	0.38	0.07	
	Average				2.28	0.43	1.19	0.15		0.17	0.44	0.85	1.26	0.16	0.05
PO - 7	0.1	04/23/1997	1145	0.76	0.18	0.62	0.07		0.02	0.86	0.80	1.68	0.12	0.06	
	0.1	05/21/1997	0940	0.67	0.23	0.48	0.05		0.02	0.70	1.00	1.72	0.07	0.04	
	0.1	06/26/1997	1315	2.48	0.71	1.84	0.14		<0.02	0.53	0.80	1.33	0.18	0.08	
	0.1	07/24/1997	0930	3.30	<0.05	<0.05	<0.04		0.20	0.01	0.70	0.91	0.14	0.03	
	0.1	08/20/1997	0840	4.10	0.53	0.93	0.12		<0.02	0.31	1.00	1.31	0.25	0.05	
	0.1	09/18/1997	0932	2.59	0.24	0.49	0.16		<0.02	0.18	0.90	1.08	0.17	0.07	
Average					2.32	0.38	0.87	0.11		0.08	0.43	0.87	1.34	0.16	0.06
	PO - 7	0.1	04/21/1999	0900	4.40	1.65	1.25	0.22		0.02	1.12	0.74	1.88	0.17	0.08
PO - 7	0.1	06/02/1999	0740	3.72	0.85	1.46	0.16		0.09	0.89	0.34	1.32	0.09	0.06	
	0.1	06/17/1999	0915						0.07	0.87	0.60	1.54	0.14	0.09	
	0.1	07/14/1999	0935	1.41	1.09	1.24	0.14		0.11	0.76	0.91	1.78	0.12	0.04	
	0.1	08/25/1999	0822	1.34	0.97	0.95	0.07		0.07	0.20	0.22	0.49	0.05	0.02	
	0.1	09/13/1999	0825	1.25	0.58	1.01	0.08		U	0.21	0.53	0.74	0.15	0.04	
	Average				2.42	1.03	1.18	0.13		0.07	0.68	0.56	1.29	0.12	0.06
PO-7	0.1	04/18/2000	0750	0.25	0.27	0.41	<0.04		U	0.26	0.51	0.77	0.08	0.03	
	0.1	05/17/2000	0748	0.53	<0.05	0.43	0.08		U	0.09	0.99	1.08	0.08	0.02	
	0.1	06/12/2000	0923	0.72	0.14	0.18	0.09		0.13	U	0.61	0.74	0.08	U	
	0.1	07/19/2000	0904	0.66	0.22	0.26	0.07	<0.04	0.05	U	0.19	0.24	0.03	U	
	0.1	08/15/2000	0749	0.73	0.18	0.15	0.05		0.07	U	0.90	0.97	0.40	0.04	
	0.1	09/12/2000	0754	0.78	0.20	0.14	0.09		U	U	0.50	0.50	0.09	0.03	
Average					0.61	0.20	0.26	0.08		0.08	0.18	0.62	0.72	0.13	0.03
	PO - 7	3.0	04/24/1996	1333	2.65	0.13	0.46	0.11		<0.02	0.02	0.60	0.62	<0.01	
PO - 7	2.5	05/22/1996	1203	4.26	0.64	1.78	0.19		0.23	1.71	0.60	2.54	0.15	0.07	
	3.0	06/18/1996	1403	4.53	0.45	2.00	0.18		0.10	1.57	0.30	1.97	0.10	0.15	
	2.0	07/15/1996	1332	1.96	0.54	<0.05	0.06		<0.02	0.57	0.50	1.07	0.04		
	2.0	08/12/1996	1317	1.53	0.59	1.77	0.11		0.05	0.07	0.80	0.92	0.06	0.02	
	2.5	09/10/1996	1118	1.34	0.68	1.52	0.10		0.03	0.01	1.10	1.14	0.16	<0.01	
	3.0	10/08/1996	1033	0.46	0.06	0.26	<0.04		0.87	0.39	0.80	2.06	0.42		
	3.5	11/07/1996	1149	0.48	0.20	2.11	<0.04		0.52	0.35	1.00	1.87	<0.01	0.07	
	Average				2.15	0.41	1.41	0.13		0.30	0.59	0.71	1.52	0.16	0.08

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO - 7	10.0	04/23/1997	1155	1.07	0.46	0.45	0.09		0.09	0.83	1.80	2.72	0.17	0.14
	6.0	05/21/1997	0946	0.78	0.34	0.56	0.06		0.04	0.73	1.10	1.87	0.09	0.04
	6.0	06/26/1997	1321	2.10	0.73	1.75	0.14		<0.02	0.55	1.10	1.65	0.18	0.06
	6.0	07/24/1997	0936	2.75	0.95	1.08	0.21		0.02	0.01	0.70	0.73	0.33	0.06
	6.0	08/20/1997	0846	2.33	0.52	0.96	0.14		0.24	0.20	3.20	3.64	0.96	0.08
	6.0	09/18/1997	0938	2.52	0.36	0.52	0.13		0.02	0.06	1.30	1.38	0.17	0.06
	Average			1.93	0.56	0.89	0.13		0.08	0.40	1.53	2.00	0.32	0.07
PO - 7	7.0	04/21/1999	0907	4.61	1.84	1.33	0.17		0.03	1.14	0.72	1.89	0.17	0.07
	10.0	06/02/1999	0750	3.54	0.82	1.42	0.17		U	0.89	0.47	1.36	0.10	0.07
	8.0	06/17/1999	0923	0.95	0.81	1.48	0.09		0.13	0.83	0.58	1.54	0.14	0.08
	7.0	07/14/1999	0942	1.65	1.06	1.32	0.11		0.08	0.77	0.57	1.42	0.11	0.04
	6.0	08/25/1999	0828	1.27	0.49	1.18	0.09		0.17	0.19	0.22	0.58	0.09	0.03
	7.0	09/13/1999	0832	1.19	0.49	0.77	0.06		0.02	0.12	1.88	2.02	0.63	0.07
	Average			2.20	0.92	1.25	0.12		0.09	0.66	0.74	1.47	0.21	0.06
PO-7	6.5	04/18/2000	0757	0.14	0.28	0.29	<0.04		U	0.24	0.55	0.79	0.10	0.04
	6.5	05/17/2000	0755	0.73	0.21	0.51	0.10		U	0.03	1.00	1.03	0.19	0.04
	6.5	06/12/2000	0930	0.96	0.17	0.22	<0.04		0.25	U	0.57	0.82	0.08	U
	6.5	07/19/2000	0911	0.66	0.23	0.10	0.06	<0.04	0.07	0.04	0.29	0.40	0.07	0.01
	6.5	08/15/2000	0756	0.73	0.19	0.15	0.05		0.07	U	1.00	1.07	0.40	0.04
	6.5	09/12/2000	0801	0.78	0.21	0.19	0.09		U	U	0.50	0.50	0.09	0.03
	Average			0.67	0.22	0.24	0.08		0.13	0.10	0.65	0.77	0.16	0.03
PO - 12	0.1	04/04/1996	1336	0.36	<0.05	0.12	<0.04							
	0.1	04/24/1996	1230	2.69	0.19	0.57	0.20		0.20	0.02	0.50	0.72	0.06	0.01
	0.1	05/22/1996	1100	3.64	0.64	1.99	0.17		0.72	0.14	0.70	1.56	0.10	0.05
	0.1	06/18/1996	1315	4.88	0.80	1.74	0.14		0.03	0.78	0.40	1.21	0.48	0.10
	0.1	07/15/1996	1200	1.51	0.65	<0.05	<0.04		<0.02	0.69	0.50	1.19	0.20	0.13
	0.1	08/12/1996	1235	1.60	0.30	2.20	<0.1		0.03	0.36	0.60	0.99	0.02	0.02
	0.1	09/10/1996	1015	1.07	0.43	1.45	0.08		0.03	0.20	0.80	1.03	0.04	<0.01
	0.1	10/08/1996	1130	0.98	0.50	1.01	0.04		0.02	0.51	1.30	1.83	0.66	0.01
	0.1	11/07/1996	1045	0.62	0.28	0.99	<0.04		0.46	0.39	0.90	1.75	0.56	0.05
	Average			1.93	0.47	1.26	0.13		0.21	0.39	0.71	1.29	0.27	0.05
PO - 12	0.1	04/23/1997	1105	0.80	<0.05	<0.05	<0.04		<0.02	0.77	1.20	1.97	0.11	0.04
	0.1	05/21/1997	0915	1.13	0.77	0.82	0.08		0.21	0.70	0.90	1.81	0.11	0.04
	0.1	06/26/1997	1245	2.61	0.64	1.46	0.15		0.27	0.47	1.00	1.74	0.06	0.05
	0.1	07/24/1997	0900	2.68	0.69	1.06	0.20		<0.02	0.01	0.70	0.71	0.06	0.03
	0.1	08/20/1997	0856	2.43	0.63	0.84	0.15		0.02	0.11	0.90	1.03	0.18	0.05
	Average			2.03	0.63	0.95	0.14		0.15	0.35	0.92	1.37	0.11	0.04

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO - 12	0.1	04/21/1999	0820						U	0.73	0.57	1.30	0.13	0.05
	0.1	06/02/1999	0805	3.54	0.89	1.47	0.17		0.04	0.89	0.33	1.26	0.08	0.08
	0.1	06/17/1999	0850	0.58	0.77	1.75	0.08		0.20	0.89	0.50	1.59	0.11	0.08
	0.1	07/14/1999	0915	1.32	1.08	1.41	0.11		0.06	0.77	0.50	1.33	0.11	0.02
	0.1	08/25/1999	0800	1.44	0.62	1.04	0.08		0.08	0.24	0.18	0.50	0.04	0.05
	0.1	09/13/1999	0813	1.31	0.57	0.99	0.07		U	0.19	0.45	0.64	0.13	0.04
Average				1.64	0.79	1.33	0.10		0.10	0.62	0.42	1.10	0.10	0.05
PO-12	0.1	04/18/2000	0730	0.31	0.27	0.43	<0.04		U	0.27	0.54	0.81	0.09	0.03
	0.1	05/17/2000	0726	0.48	0.26	<0.05	<0.04			0.10	0.58	0.68	0.09	0.02
	0.1	06/12/2000	0902	0.69	0.15	0.18	0.12		0.27	U	0.85	1.12	0.08	U
	0.1	07/19/2000	0843	0.64	0.22	0.29	0.07	<0.04	0.03	U	0.20	0.23	0.08	U
	0.1	08/15/2000	0728	0.73	0.18	0.13	0.06		0.08	U	0.82	0.90	0.13	0.02
	0.1	09/12/2000	0733	0.73	0.19	0.20	0.08		U	U	0.40	0.40	0.05	0.02
Average				0.60	0.21	0.25	0.08		0.13	0.19	0.57	0.69	0.09	0.02
PO - 12	4.0	04/24/1996	1234	2.40	0.14	0.49	0.18		<0.02	0.03	0.90	0.93	<0.01	
	6.5	05/22/1996	1107	3.93	0.82	1.85	0.23		0.83	0.38	0.50	1.71	0.26	0.06
	6.0	06/18/1996	1321	4.83	1.24	1.83	0.15		0.09	0.68	<0.1	0.77	0.20	0.20
	5.0	07/15/1996	1205						0.02	0.78	0.50	1.30	0.06	
	6.0	08/12/1996	1241	1.57	0.67	1.78	0.10		0.04	0.40	0.50	0.94	0.02	0.03
	6.0	09/10/1996	1021	1.21	0.52	1.49	0.08		0.03	0.12	0.80	0.95	0.05	<0.01
	7.0	10/08/1996	1137	1.01	0.49	1.26	<0.04		0.48	1.06	0.50	2.04	0.58	
	7.5	11/07/1996	1053	0.66	0.22	1.00	<0.04		0.49	0.38	0.80	1.67	0.31	0.06
Average				2.23	0.59	1.39	0.15		0.28	0.48	0.64	1.29	0.21	0.09
PO - 12	10.5	04/23/1997	1116	0.65	0.25	0.61	0.05		<0.02	0.74	1.50	2.24	0.09	0.08
	9.0	05/21/1997	0924	0.87	0.46	0.71	0.06		0.11	0.66	5.60	6.37	1.50	0.17
	9.0	06/26/1997	1254	2.31	0.72	1.71	0.08		0.04	0.70	5.70	6.44	2.00	0.18
	9.0	07/24/1997	0909	2.34	0.68	1.12	0.17		0.36	0.08	0.60	1.04	0.09	0.05
	9.0	08/20/1997	0905	2.37	0.50	0.89	0.11		<0.02	0.12	0.80	0.92	0.15	0.10
	9.0	09/18/1997	0919	2.58	0.42	0.49	0.14		0.05	0.10	1.30	1.45	0.19	0.05
Average				1.85	0.51	0.92	0.10		0.14	0.40	2.58	3.08	0.67	0.11
PO - 12	7.5	04/21/1999	0828	10.00	1.23	3.73	0.20		0.06	1.45	0.76	2.27	0.18	0.07
	9.0	06/02/1999	0814	3.61	0.78	1.39	0.15		0.06	0.70	0.41	1.17	0.15	0.05
	10.0	06/17/1999	0900	0.59	0.80	1.30	0.05		0.10	0.75	1.94	2.79	0.67	0.15
	7.5	07/14/1999	0923	1.32	0.96	1.26	0.12		0.07	0.76	0.47	1.30	0.10	0.02
	8.0	08/25/1999	0808	1.43	0.46	0.93	0.09		0.21	0.20	0.24	0.65	0.13	0.03
	7.0	09/13/1999	0820	1.34	0.54	0.90	0.07		U	0.19	0.57	0.76	0.17	0.04
Average				3.05	0.80	1.59	0.11		0.10	0.68	0.73	1.49	0.23	0.06

Station	Depth M	Date mm/dd/yy	Time hhmm	Atrazine ug/L	Alachlor ug/L	Metolachlor ug/L	Cyanazine ug/L	Acetochlor ug/L	Ammonia mg/L	NO3/NO2 mg/L	TKN mg/L	TN mg/L	T - Phos mg/L	T - Ortho-P mg/L
PO-12	7.5	04/18/2000	0738	0.19	0.16	0.41	<0.04		0.03	0.24	1.00	1.27	0.30	0.02
	7.5	05/17/2000	0734	0.64	0.10	0.08	0.19		U	0.10	0.61	0.71	0.09	0.02
	7.5	06/12/2000	0910	0.76	<0.05	0.26	<0.04		0.35	U	1.00	1.35	0.21	U
	7.5	07/19/2000	0851	0.61	0.26	0.24	0.05	<0.04	U	U	0.18	0.18	0.10	U
	7.5	08/15/2000	0736	0.73	0.18	0.13	0.06		0.04	U	1.00	1.04	0.27	0.03
	7.5	09/12/2000	0741	0.75	0.21	0.15	0.09		U	U	0.40	0.40	0.07	0.02
Average				0.61	0.18	0.21	0.10		0.14	0.17	0.70	0.83	0.17	0.02